Pengaruh penambahan antioksidan alfa-tokoferol dalam medium maturasi oosit domba garut (ovis aries) terhadap kualitas dan viabilitas oosit pascavitrifikasi = Effect addition of antioxidant alpha tocopherol in medium maturation on quality and viability of garut sheep (ovis aries) oocytes after vitrification

Annisa Novalia Nurindzira, author

Abstrak

Sebagai salah satu sumber daging di Jawa Barat, domba garut dapat mengalami penurunan mutu genetik akibat perkawinan dalam populasi yang tak terkontrol, sehingga perlu dilakukan konservasi dengan metode vitrifikasi. Sebelum divitrifikasi, oosit dimaturasi terlebih dahulu dengan penambahan alfa-tokoferol dalam medium maturasi yang berfungsi untuk mengurangi pengaruh negatif Reactive oxygen species ROS selama proses maturasi.

Penelitian ini dilakukan untuk mengetahui kemampuan antioksidan alfa-tokoferol dalam meningkatkan kemampuan maturasi oosit dan mempertahankan kualitas dan viabilitas oosit domba garut Ovis aries hingga proses vitrifikasi. Sebanyak 125 oosit kualitas A dan B dimaturasi dalam medium maturasi TCM-199 dengan penambahan alfa-tokoferol sebanyak 0 M KK, 100 M KP1, 150 M KP2, dan 200 M KP3. Oosit yang telah matang divitrifikasi dengan krioprotektan etilen glikol 15 dan dimetil sulfoksida 15. Viabilitas oosit dianalisis dengan pewarna Hoechst dan Propidium Iodide.

Berdasarkan hasil penelitian, diperoleh persentase oosit matang pascamaturasi, yaitu 66,67 KK, 66,67 KP1, 70,73 KP2, dan 82,50 KP3. Persentase viabilitas oosit pascavitrifikasi, yaitu 82,14 KK, 87,50 KP1, 93,55 KP2, dan 84,00 KP3. Persentase kualitas oosit pascavitrifikasi, yaitu 53,57 KK, 54,17 KP1, 58,06 KP2, dan 24,00 KP3. Hasil penelitian menunjukkan bahwa penambahan alfa-tokoferol memberikan pengaruh terhadap tingkat kematangan oosit, viabilitas, dan kualitas oosit pascavitrifikasi, meskipun secara statistik tidak menunjukkan perbedaan antarperlakuan.

Penambahan alfa-tokoferol cenderung meningkatkan laju maturasi pada konsentrasi yang lebih tinggi 150 M dan 200 M. Penambahan alfa-tokoferol pada tahap maturasi dapat meningkatkan stabilitas membran, sehingga viabilitas dan kualitas oosit dengan penambahan alfa-tokoferol 150 M pascavitrifikasi menjadi lebih baik dibandingkan dengan kontrol. Pada oosit yang abnormal pascavitrifikasi, tipe kerusakan dibagi menjadi perubahan bentuk oosit, homogenitas sitoplasma, keutuhan sitoplasma dan tingkat kerusakan pada zona pelusida. Kerusakan zona pelusida menjadi kerusakan yang paling mempengaruhi viabilitas dan perkembangan oosit di tahap selanjutnya, seperti fertilisasi. Penambahan antioksidan alfa-tokoferol 150 M dalam medium maturasi merupakan konsentrasi yang optimal dalam mempertahankan viabilitas dan kualitas oosit pascavitrifikasi.

.....

As a source of meat in West Java, Garut sheep genetic quality can decreased by uncontrolled mating within population, so it needs to be conserved by vitrification method. Before vitrification, Oocytes must be matured first with addition of alpha tocopherol in a maturation medium which to reduced the negative effect of Reactive oxygen species ROS during the maturation process.

This study was conducted to determine the ability of alpha tocopherol antioxidants in improving the ability

of oocyte maturation and maintain the quality and viability of sites Garut sheep until vitrification process. As many as 125 oocytes with grade A and B were matured in a TCM 199 maturation medium with the addition of alpha tocopherol of 0 M KK, 100 M KP1, 150 M KP2, and 200 M KP3. The matured oocytes was vitrified by cryoprotectant ethylene glycol 15 and dimethyl sulphoxide 15. The viability of oocyte was analyzed by Hoechst and Propidium Iodide dyes.

Based on result, the percentage of matured oocyte is 66,67 KK ,66,67 KP1,70,73 KP2, and 82,50 KP3. Percentage viability of oocytes after vitrification is 82.14 KK, 87.50 KP1, 93.55 KP2, and 84.00 KP3. Percentage quality of oocytes after vitrification is 53,57 KK,54,17 KP1,58,06 KP2, and 24,00 KP3. The results showed that the addition of alpha tocopherol gave considerable influence on oocyte maturation rate, viability and quality after vitrification, although statistically did not show differences between treatments. Addition of alpha tocopherol tends to increase maturation rates at higher concentrations 150 M and 200 M. Addition of alpha tocopherol at the maturation medium increase membrane stability, so the viability and quality of oocytes with the addition of alpha tocopherol 150 M after vitrification better than the control. Abnormality on oocytes after vitrification, the type of damage is divided into changes on oocyte shape, homogenity of cytoplasmic, integrity of cytoplasmic and degree of zona pellucida fracture. Fracture on zona pellucida becomes the most damaging damage affecting the viability and development of oocytes in the next stage, such as fertilization. The addition of alpha tocopherol 150 M antioxidants in maturation medium is a better concentration on maintaining viability and quality of oocytes after vitrification.